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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,418	11/20/2001	Joerg Sutter	10191/1860	3975

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EXAMINER

DUDA, RINA I

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/889,418

Applicant(s)

SUTTER ET AL.

Examiner

Rina I Duda

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10, 11, 15 and 16 is/are rejected.
- 7) ☒ Claim(s) 12-14 and 17-21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other:

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "n\_soll". A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. The specification mentions reference character "Nsetpoint", do "n\_soll" and "Nsetpoint" designate the same thing?.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 10-11 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (US Patent 5640073) and Heeren et al (US patent 6078158).

Claim 10, Ikeda et al teach a method for commutating/driving a brushless DC motor 11 including stator windings 12-1, 12-2, and 12-3 fed by a multi-phase converter 15, said method comprising; detecting the moment of commutation by comparing a voltage induced (bemf voltage) in a motor winding using voltage comparators 22-21, 22-2, and 22-3 to a reference voltage V<sub>nout</sub>; and changing the reference voltage in

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response to a desired rotational speed (as described in column 7 lines 63-67 and column 8 lines 1-12). Ikeda et al fail to describe that the induced voltage would be taken from an un-energized winding.

However, Heeren et al describe in column 1 lines 60-67 and column 2 lines 1-20 a conventional way of commutating a multi-phase motor using induced voltage, Heeren et al describes that current is applied to two of the three motor phases (If three phase motor) leaving the third motor phase floating, the voltage seen in this floating motor phase is the voltage induced by the movement of the rotating magnets relative to the coil, the induced voltage is also called  $bemf$ .

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the phase in which no current is applied to detect a voltage, since said un-energized motor phase can provide a voltage measurement indicative of the speed/position of the motor.

Claims 11 and 15, the power switches in converter 15 will be turn "on" or "off" to obtain a desired current/voltage signal, wherein said desired current/voltage signal will be based on the command speed, as described in column 9 lines 41-67.

Claim 16 is rejected for the same reason given above with respect to claim 10, furthermore Ikeda et al describes control unit 18, which is responsible for turning "on" and "off" the power switches which are connected to the motor windings in order to select/discriminate which phase will be energized or unenergized at a time; means 24 for changing the reference voltage in accordance with a specific speed signal; and

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means 23 for supplying a manipulated variable to means 24 as a function of the desired motor speed.

### ***Claim Objections***

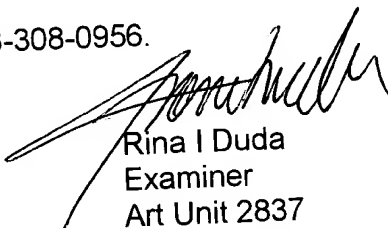
4. Claims 12-14 and 17-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: The prior art made of record fails to disclose a commutation control apparatus for a brushless DC motor including a phase converter, a control unit, a commutation detection device; a commutation shift element for changing a reference voltage in accordance with a parabola, wherein said parabola-shaped reference voltage begins at a pulse width modulation ration of about 90 to 95%.

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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rina I Duda whose telephone number is 703-305-0722.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi can be reached at 703-308-3370. The fax phone numbers for the organization where this application or proceeding is assigned is 703-308-7722 for regular communications and After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Rina I Duda  
Examiner  
Art Unit 2837

RD  
December 2, 2002